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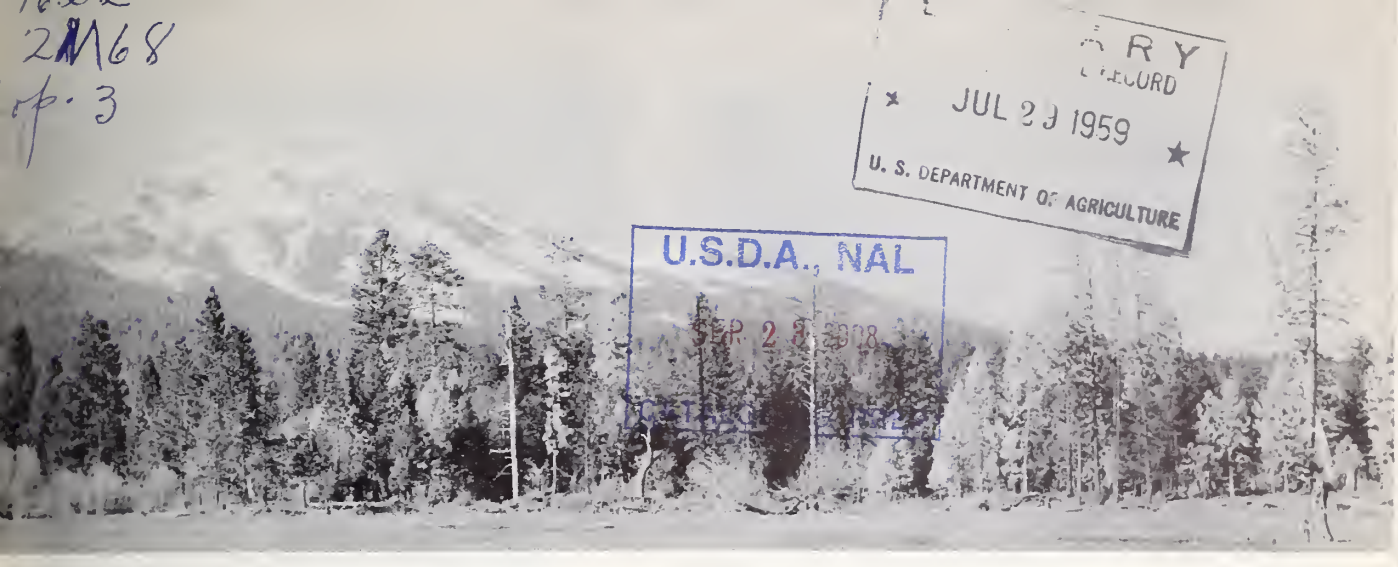


Miscellaneous Paper No. 34
April 1959

PACIFIC SOUTHWEST
FOREST AND RANGE
EXPERIMENT STATION
Berkeley - California

FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE

Timber or Snags in 1959?

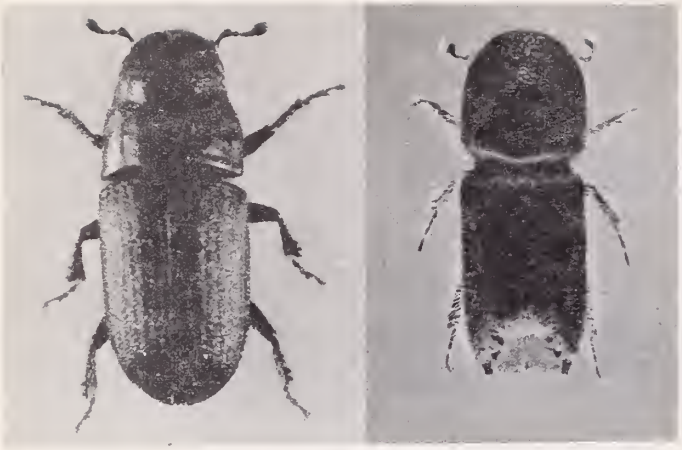
...quick action now may save trees from serious bark beetle damage this year

A bumper crop of bark beetles seems to be in the making in California's ponderosa pine forests this year. This is the conclusion Station entomologists have drawn from insect detection reports already turned in by field-going foresters, and from their own observations and knowledge of conditions leading up to outbreaks.

Past experience has shown that upsurges in bark beetle populations often occur during warm, dry seasons such as the one we are currently experiencing. These sometimes erupt into virulent epidemics, destroying thousands of board feet of valuable timber.

The prospect of serious damage is most critical in ponderosa pine stands at low elevations (below 4,500 feet) in the Coast Range and Sierra Nevada. Unless foresters and timber operators are aware of the situation, they themselves may unknowingly contribute to the problem, and thereby lose a good percentage of their reserve timber, the trees on which they are depending for future cuts. However, if they are alert, they can do much to help keep damage to a minimum.

To see what often happens in years like this, why it happens, and just what specifically can be done toward keeping the beetles in check, let's take a look at the overall picture.



WESTERN PINE BEETLE FIVE-SPINED ENGRAVER

SLASH

Bark Beetles Join Forces

In the low-elevation ponderosa pine zone, the California five-spined engraver (Ips confusus (Lec.)) and the western pine beetle (Dendroctonus brevicomis Lec.) frequently team up to attack and kill standing green trees. This combination is most destructive in the wake of spring logging operations, road and powerline right-of-way clearings, and wind or snow breakage. It is especially potent in warm, dry years when the ability of trees to withstand insect attacks is liable to be reduced.

How Outbreaks Develop

Outbreaks get started in fresh slash during the late winter and early spring months of years when breeding conditions for the beetles are favorable. Here's how they develop: In March or April, pine engravers attack and lay their eggs in cut or storm-broken ponderosa pine. In the spring months the engravers are generally unable to breed successfully in standing green trees at this time, but continue to produce successive generations in slash.

Under optimum conditions, it takes the beetles in slash less than 6 weeks to go through their normal course of development, from eggs to larvae, to pupae, finally to emerge as new adults.

In dry years, even healthy trees seem to lose some of their ability to resist engraver attacks during the spring months. And by mid-June, when the late spring broods emerge, the beetles move to the green stand. Small trees, easily identified in late July or early August by their fading foliage, often are killed outright. Larger trees are usually only top-killed, creating "red tops" throughout the stand.

"RED TOPS"

WESTERN PINE BEETLE EGG GALLERIES

Enter the Western Pine Beetle

Pine engravers alone generally are not able to reproduce in standing trees in large enough numbers to maintain themselves for successive generations. But they play a key role in paving the way for the development of western pine beetle epidemics. Top-killed trees are prime fodder for the western pine beetle, which now enters upon the scene attacking the boles below the pine engraver. From this source spring huge western pine beetle populations that spread into the surrounding timber. There they and their progeny cause extensive tree-killing.

Why 1959 Promises to be a Bad Year

There are two primary reasons why this year looks like a bad one for ponderosa pine. The first is the presence of a large overwintering population of pine engravers, evidently the result of a buildup that occurred during the extended warm, dry weather late last fall. The second is the fact that the past winter and early spring months have been exceptionally warm and dry, creating conditions favorable to the beetles, but unfavorable to the trees. All that is needed to trigger an outbreak is an abundant supply of suitable breeding material. In some pole stands in the southern Sierra, breakage from winter storms already fulfills this requirement.

What Can Be Done to Hold Losses Down

Obviously, the time to nip insect outbreaks is before they get started. The majority of pine engraver-western pine beetle outbreaks stem from early season logging. By modifying certain practices, positive steps to forestall outbreaks can be taken.

The best preventative is to schedule cutting operations from mid-July to late fall or winter. If no fresh slash is available before mid-summer, explosive bark beetle buildups of the type that develop in spring slash will not occur.

When it is not practical to delay logging, as often is the case, lopping and scattering the limbs of felled pine tops left in the woods is the next best choice. Fresh slash above 3 inches in diameter is a potential source of trouble. By lopping and scattering the slash so as to expose it to the drying effects of the sun's heat, its capacity to produce beetles can be reduced by about 75 percent. Do not bunch or pile green slash from cuttings made between February and July, unless it is to be treated so as to prevent it from producing beetles.

Close utilization also helps to minimize the hazard from beetles. Utilizing to an 8-inch top instead of, for example, a 14-inch top will eliminate 80 percent of the insect breeding material that otherwise would be left in the woods. Together, lopping and scattering plus close utilization can reduce the beetle production potential of ponderosa pine slash by 95 percent.

Sometimes, for one reason or another, it is impractical to adopt any of these practices. When this happens, and pine engravers begin to build up in slash, one ace in the hole is left--direct control. Recent research by Station entomologists has shown that lindane spray lightly applied to infested material is deadly to pine engravers. Instructions for preparing and using this insecticide can be obtained from the Station.

IN SHORT

Increased damage from bark beetles is in prospect in the ponderosa pine belt this year. Most likely places for outbreaks to start are around spring cuttings, particularly logging operations, and land clearings for roads, powerlines, and other purposes; around pruning or thinning operations in green timber, and in stands damaged by winter storms. To keep damage to a minimum, here are the things that can be done.

1. Schedule cuttings after mid-July when possible.
2. Lop and scatter fresh slash from spring cuttings. Do not bunch or pile green slash.
3. Utilize all cut trees to an 8-inch top diameter when practicable; avoid cutting small trees where there is a choice.
4. Check slash and surrounding timber periodically for signs of aggressive bark beetle infestations.
5. Use direct control measures when necessary to control outbreaks.

More detailed information about the California five-spined engraver and the western pine beetle is contained in the publications listed below. For copies write to Director, Pacific Southwest Forest and Range Experiment Station, P. O. Box 245, Berkeley 1, California.

Keen, F. P.
1955. The western pine beetle. U. S. Dept. Agr. Forest Pest Leaflet 1, 4 pp., illus.

Lyon, R. L.
1959. Lindane--a better insecticide for pine engraver beetles. Calif. Forest and Range Expt. Sta. Misc. Paper 29, 2 pp., illus.

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1959. Directions for using lindane sprays to control pine engravers. Pacific Southwest Forest and Range Expt. Sta. Misc. Paper 33 5 pp.

Stevens, R. E.
1959. Ethylene dibromide sprays for controlling bark beetles in California. Calif. Forest and Range Expt. Sta. Res. Note No. 147, 6 pp., illus.

Struble, G. R.
1955. California five-spined engraver beetle. U. S. Dept. Agr. Forest Pest Leaflet 4, 4 pp., illus.

Struble, G. R. and Hall R. C.
1955. The California five-spined engraver, its biology and control, U. S. Dept. Agr. Cir. 964, 21 pp., illus.

Whiteside, J. M.
1951. The western pine beetle, a serious enemy of ponderosa pine. U. S. Dept. Agr. Cir. 864, 11 pp., illus.

(Compiled from material furnished by the Division of Forest Insect Research)

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